

INTERNATIONAL COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION
(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C.20231
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 13 June 2000 (13.06.00)	To: Assistant Commissioner for Patents United States Patent and Trademark Office Box PCT Washington, D.C.20231 ETATS-UNIS D'AMERIQUE in its capacity as elected Office
International application No. PCT/IB99/01574	Applicant's or agent's file reference F14582IN
International filing date (day/month/year) 23 September 1999 (23.09.99)	Priority date (day/month/year) 09 October 1998 (09.10.98)
Applicant SWANEPOEL, Adriaan, Retief	

1. The designated Office is hereby notified of its election made:

in the demand filed with the International Preliminary Examining Authority on:

27 April 2000 (27.04.00)

in a notice effecting later election filed with the International Bureau on:

2. The election was

was not

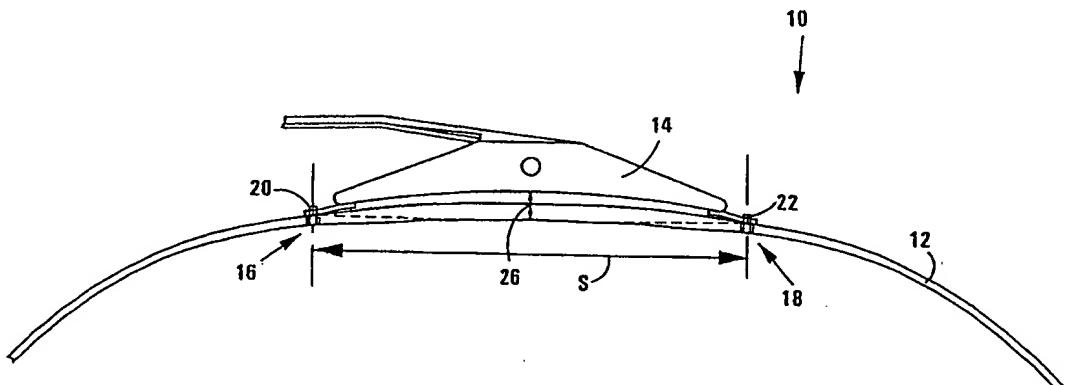
made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer S. Mafla
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : B60S 1/38, 1/40		A1	(11) International Publication Number: WO 00/21810 (43) International Publication Date: 20 April 2000 (20.04.00)
(21) International Application Number: PCT/IB99/01574		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 23 September 1999 (23.09.99)			
(30) Priority Data: 98/9244 9 October 1998 (09.10.98) ZA			
(71) Applicant (for all designated States except US): TRICO PRODUCTS CORPORATION [US/US]; 3255 West Hamlin Road, Rochester Hills, MI 48309 (US).			
(72) Inventor; and			
(75) Inventor/Applicant (for US only): SWANEPOEL, Adriaan, Retief [ZA/ZA]; 309 Aries Street, Waterkloof Ridge, 0181 Pretoria (ZA).		Published With international search report.	
(74) Agent: NACHENIUS, Elizabeth; Adams & Adams (Johannesburg Office), 3rd floor, 23 Wellington Road, Parktown, P.O. Box 10155, 2000 Johannesburg (ZA).			

(54) Title: A WINDSCREEN WIPER



(57) Abstract

A windscreen wiper (10) includes an elongate curved backbone (12) which is of a resiliently flexible material and a force applying member (14) which is connected to the backbone at two spaced apart points (20, 22). The spacing distance S (expressed in millimetres) between the points then is between (1) $S_1 = 0.1 * L$ and (2) $S_2 = 0.35 * L$ where the length is the total length of the backbone expressed in millimetres.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

A WINDSCREEN WIPER

10 This invention relates to a windscreen wiper, which is also known as a windshield wiper.

The invention relates in particular to a windscreen wiper which has a curved backbone and which may have a varying width and/or thickness. It will be appreciated 15 by those skilled in the art that the backbone may be in the form of a beam that is curved in a plane or may have compound curvature. The beam will then usually have width and thickness dimensions. The beam will also have a radius of curvature at each point along its length.

20 When such a windscreen wiper is pressed onto a surface such as the windscreen (or windshield) of a vehicle, the force intensity (the force per unit length) will vary at different positions along the length of the beam. A large number of factors affect the manner in which the force intensity distribution varies, such as:

25 the material from which the beam is made and the Young's modulus thereof;

the length of the beam;

curvature of the beam;

curvature of the surface;

30 variation in any one or both of the width of the beam and the thickness of the beam;

the magnitude of the force applied to the beam; and

the position, or positions, at which the force is applied.

35 The applicant has found that, with shorter beams, it is adequate to apply the force at a single point. However, with longer beams, ie beams that are longer than about 400mm it is preferable to apply the force to the beam at two spaced apart points. The applicant has further found that the degree of variation of force intensity resulting from changes in curvature of the surface and the magnitude of the force applied to the beam, in use, varies significantly depending on the spacing between the 40 points of application of the force and the ratio between the spacing distance and the total length of the beam.

45 The applicant has further found that if the spacing between the points exceeds a certain limit, the windscreen wiper will not operate in an efficient manner. There are two main factors which should be taken into account when determining the upper bound of the spacing between the points. Firstly, the vertical clearance between the beam and a force applying member should be taken in to account when, in use, the beam changes from straight to free form and vice versa. Secondly, longitudinal movement of the beam between the force application points should also be 50 considered, when the beam changes from straight to free form and vice versa.

55 The applicant has conducted substantial analysis in this regard and believes that he has found a relationship between the spacing distance and the total length of the beam and, consequently, between the ratio of spacing distance to total length and length, which provides a windscreen wiper that operates in an improved manner.

According to a first aspect of the invention there is provided a windscreen wiper which includes

an elongate curved backbone which is of a resiliently flexible material; and

60 a force applying member which is connected to the backbone at two spaced apart points

with the spacing distance S (expressed in millimetres) between the points being between

$$S_1 = 0.1 * L \dots \dots \dots \quad (1)$$

65 and

$$S_2 = 0.35 * L \dots \dots \dots \quad (2)$$

where the length L is the total length of the backbone expressed in millimetres.

Further according to a second aspect of the invention there is provided a
70 windscreen wiper which includes

an elongate curved backbone which is of a resiliently flexible material; and

a force applying member which is connected to the backbone at two spaced apart points

with the ratio R of spacing distance S between the points and the total length

75 L (R = S/L) being between

$$R_1 = 0.1 \dots \dots \dots \quad (3)$$

and

$$R_2 = 0.35 \dots \dots \dots \quad (4)$$

80

where the spacing distance S and the length L are expressed in the same units of

measure.

The preferred spacing distance S_p between the spaced apart points is about

85 $S_p = 0.363 * L - 0.000146 * L^2 \dots\dots\dots$ (5)

and the preferred ratio R_p is about

$R_p = 0.363 - 0.000146 * L \dots\dots\dots$ (6)

90 The force applying member may be connected to the backbone in such a manner as to permit relative longitudinal displacement between the force applying member and the backbone.

95 The curved backbone may have a varying width and or thickness, along its length. The backbone may further have a free form curvature in a plane or may have a compound curvature (that is curved in two planes).

100 It will be appreciated that the force applying member normally straddles the geometric centre of the backbone. This is particularly so for a windscreen wiper that is intended for use on a driver's side. However, the force applying member may be positioned off-centre for certain cases, such as on passenger side windscreens. In that way the overall performance of the wiper may be optimised.

105 The invention is now described, by way of example with reference to the accompanying drawings. In the drawings,

Figure 1 shows schematically a windscreen wiper in accordance with the invention;

Figure 2 or Graph A illustrates the beam width at various positions along the length of the beam;

110 Figure 3 or Graph B illustrates the thickness of the beam at various positions along the length of the beam;

Figure 4 or Graph C shows the beam centre-line coordinate relative to the position along the length of the beam;

Figure 5 or Graph D illustrates the typical clearance required for the beam as a function of spacing distance S; and

115 Figure 6 or Graph E illustrates the typical amount of longitudinal movement between the beam and the pin when the beam changes shape from curved to straight and vice-versa.

120 The windscreen wiper 10 includes a backbone 12 which is in the form of a beam. The beam is made from spring steel having a Young's modulus of 205GPa.

The length of the beam is 700mm. The beam tapers both in width and thickness from its centre toward its free ends or tips as shown in Graph A and Graph B respectively.

125 Graph A illustrates the beam width (in millimetres) at various positions along the length of the beam, which is also measured in millimetres. Graph B illustrates the thickness of the beam (in millimetres) at various positions along the length of the beam which is also measured in millimetres.

130 The beam is curved longitudinally, in a plane, with a predetermined radius of curvature at every point along its length. Graph C shows the beam centre-line coordinate relative to the position along the length of the beam (in millimetres).

A force applying member 14 is connected to the beam 12 at two spaced apart points 16 and 18, with a spacing distance S between the points. At the point 16, the force applying member 14 is connected to the beam 12 by means of a pin 20 which 135 is pivotally located in a complementary hole in the beam 12 which does not permit relative longitudinal movement between the beam 12 and the force applying member 14. At the other point 18, the force applying member 14 is connected to the beam 12 by means of a pin 22 which is received in a longitudinal slot 24 in the beam 12 so that relative longitudinal and pivotal movement between the pin 22 and beam 12 is 140 permitted.

It will be appreciated that there needs to be clearance between the force applying member 14 and a line between the points 16 and 18, indicated at 26, in which the section of the beam 12 between the points 16 and 18 can move when the 145 beam changes shape from curved to straight and vice-versa.

Graph D illustrates the typical clearance 26 required for the beam 12 described above as a function of spacing distance S and Graph E illustrates the typical amount of longitudinal movement between the beam 12 and the pin 22 when the beam 12 150 changes shape from curved to straight and vice-versa.

The spacing S is 150mm. In this case, the ratio R of spacing distance S between the points 16 and 18 and the total length L ($R = S/L$) is therefore 0,214.

CLAIMS:

1. A windscreen wiper which includes
an elongate curved backbone which is of a resiliently flexible material; and
a force applying member which is connected to the backbone at two spaced

160 apart points

with the spacing distance S (expressed in millimetres) between the points being
between

$$S_1 = 0.1 * L \dots \dots \dots \quad (1)$$

and

165 $S_2 = 0.35 * L \dots \dots \dots \quad (2)$

where the length L is the total length of the backbone expressed in millimetres.

2. A windscreen wiper which includes

an elongate curved backbone which is of a resiliently flexible material; and

170 a force applying member which is connected to the backbone at two spaced
apart points

with the ratio R of spacing distance S between the points and the total length
L ($R = S/L$) being between

175 $R_1 = 0.1 \dots \dots \dots \quad (3)$

and

$$R_2 = 0.35 \dots \dots \dots \quad (4)$$

where the spacing distance S and the length L are expressed in the same units of
180 measure.

3. The windscreen wiper as claimed in Claim 1, in which the preferred spacing distance S_n between the spaced apart points is about

$$S_p = 0.363 * L - 0.000146 * L^2 \dots \dots \dots \quad (5)$$

185 4. The windscreen wiper as claimed in Claim 2, in which the preferred ratio R_p is
about

$$R_p = 0.363 - 0.000146 * L \dots \dots \dots \quad (6)$$

5. The windscreen wiper as claimed in Claim 1, in which the force applying member is connected to the backbone in such a manner as to permit relative longitudinal displacement between the force applying member and the backbone.

6. The windscreen wiper as claimed in Claim 1, in which the curved backbone has a varying width and thickness, along its length.

195 7. The windscreen wiper as claimed in Claim 1, in which the curved backbone has
a constant thickness along its length.

8. The windscreen wiper as claimed in Claim 1, in which the curved backbone has a constant width along its length.

200

9. The windscreen wiper as claimed in Claim 1, in which the backbone has a free form curvature in a plane.

10. The windscreen wiper as claimed in Claim 1, in which the backbone has a
205 compound curvature.

11. The windscreen wiper as claimed in Claim 1, in which the force applying member straddles the geometric centre of the backbone.

12. A windscreen wiper substantially as herein described with reference to the
210 accompanying drawing.

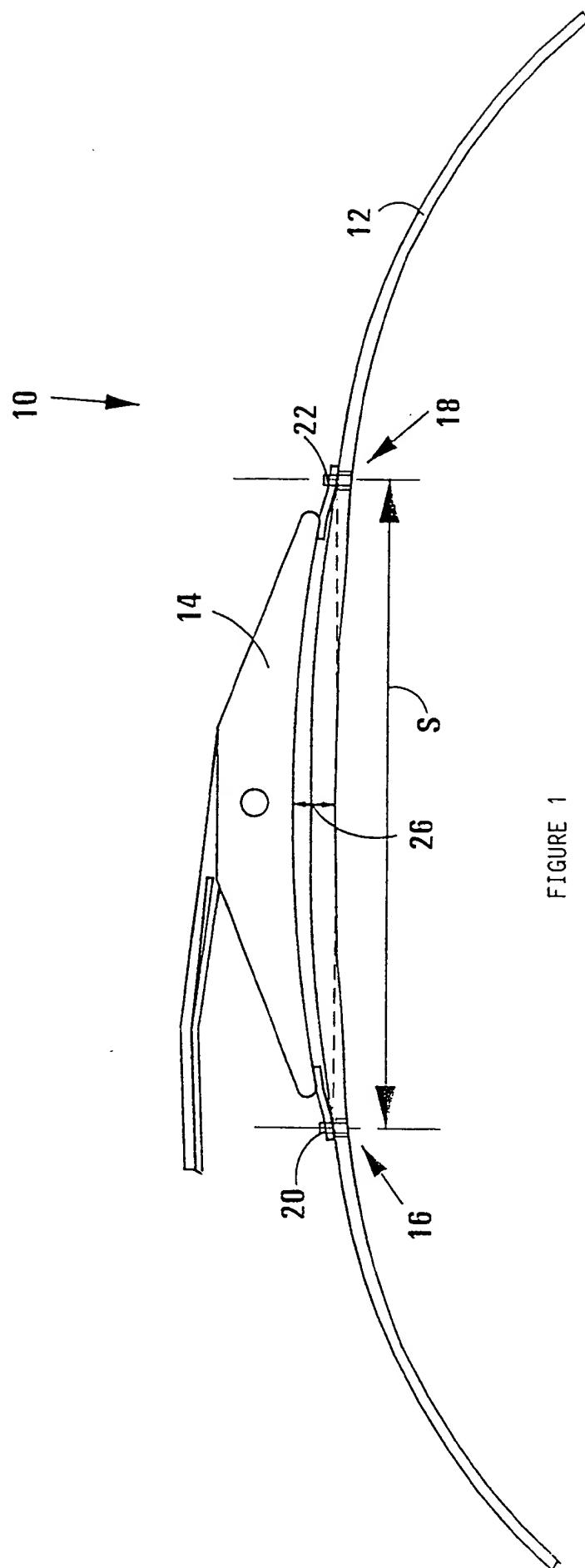
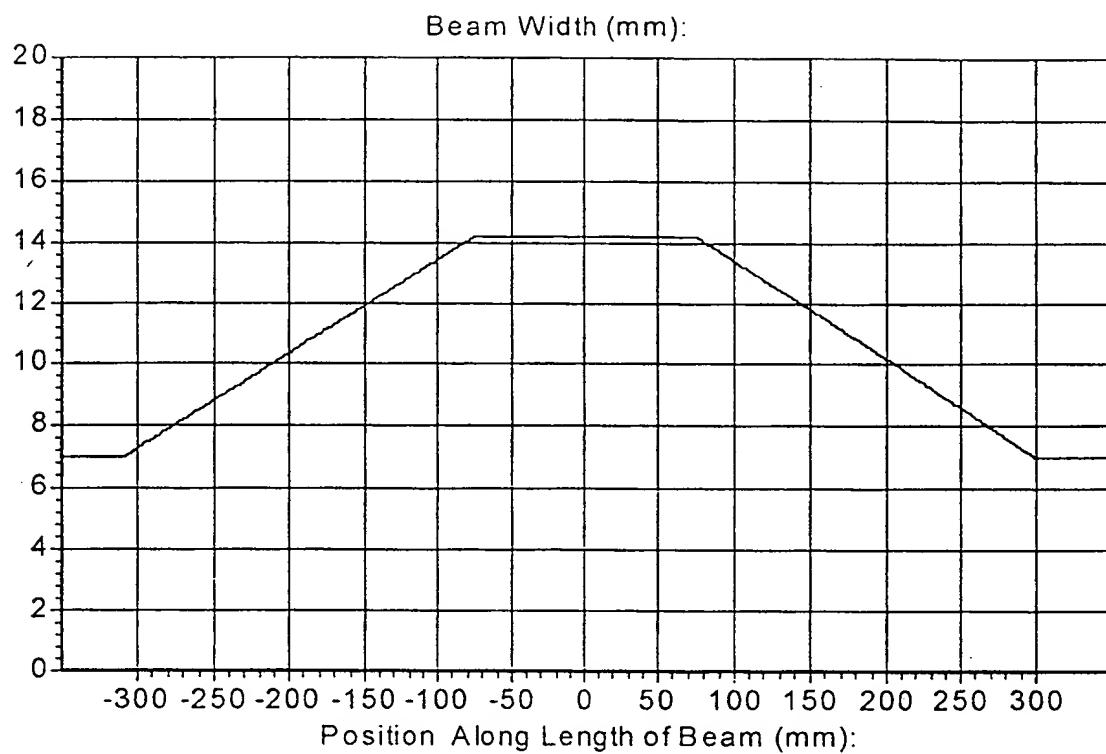
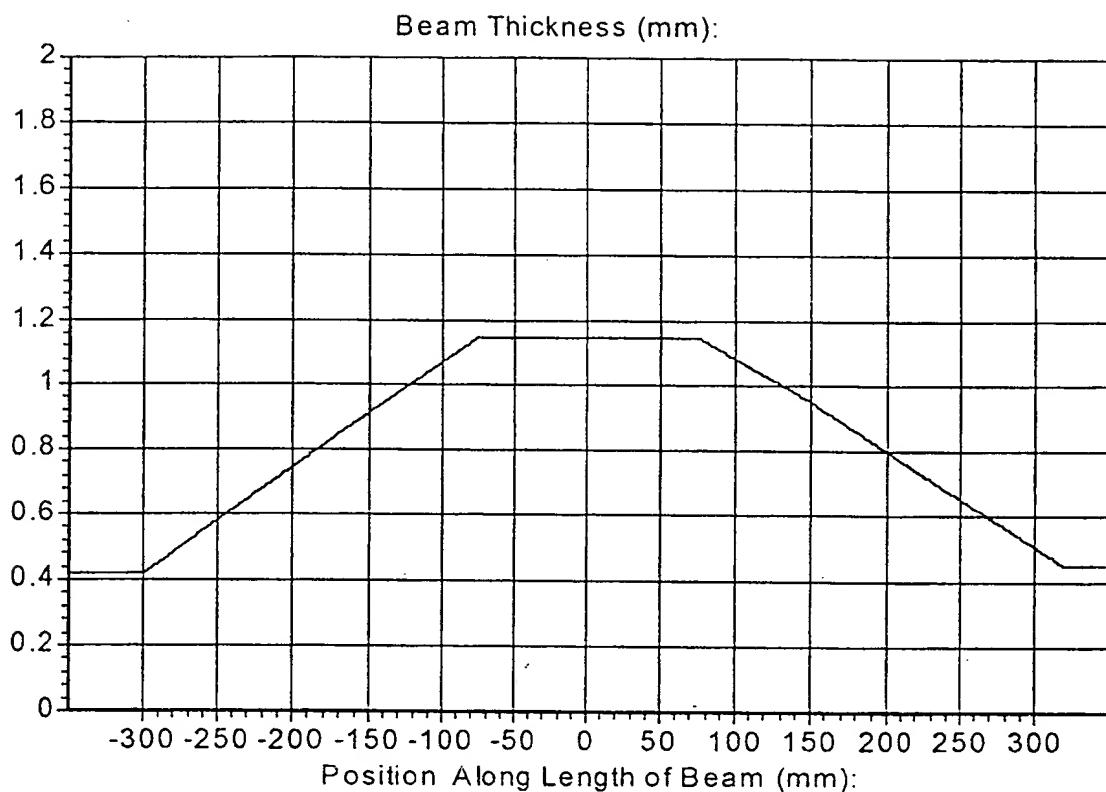


FIGURE 1



GRAPH A.

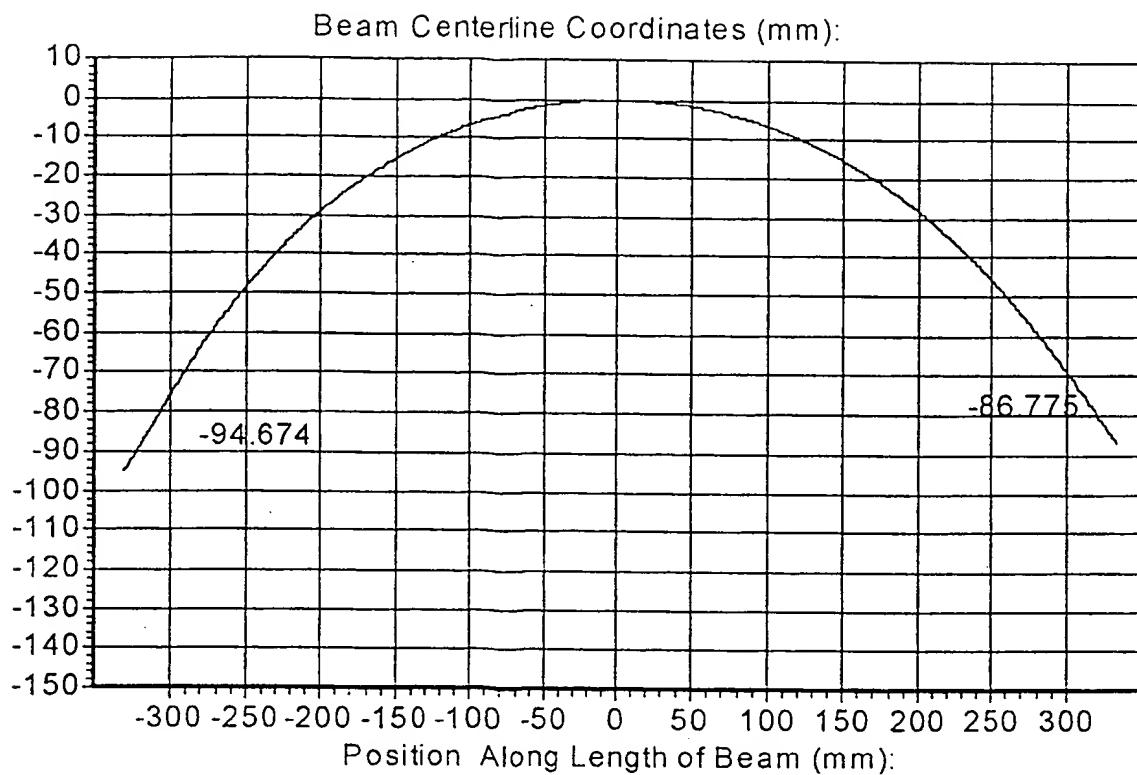
FIGURE 2



GRAPH B.

FIGURE 3

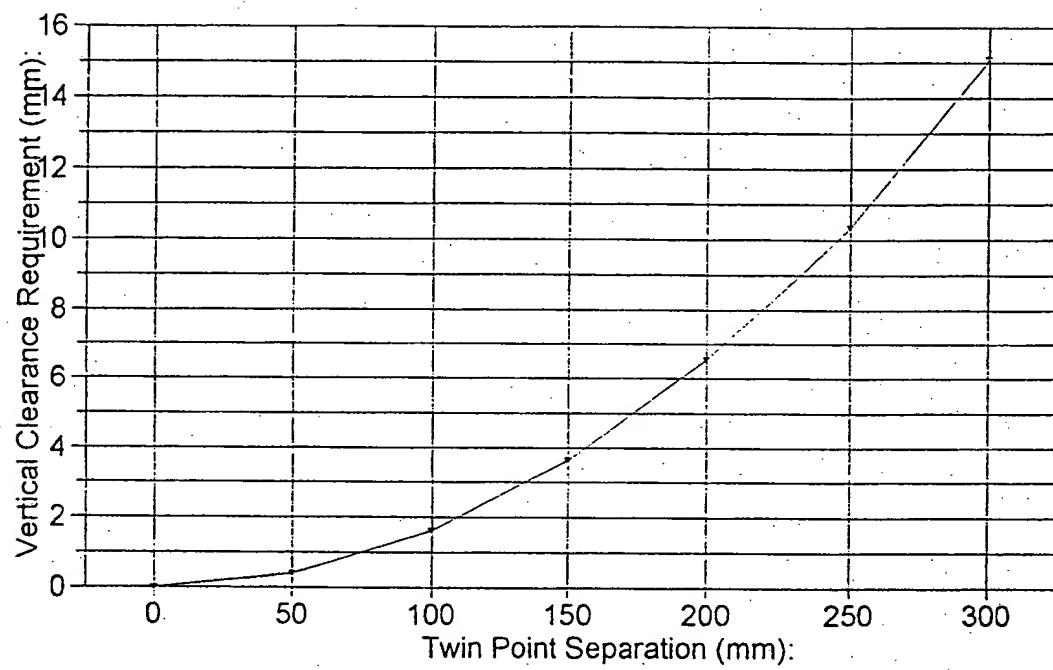
4 / 6



GRAPH C.

FIGURE 4

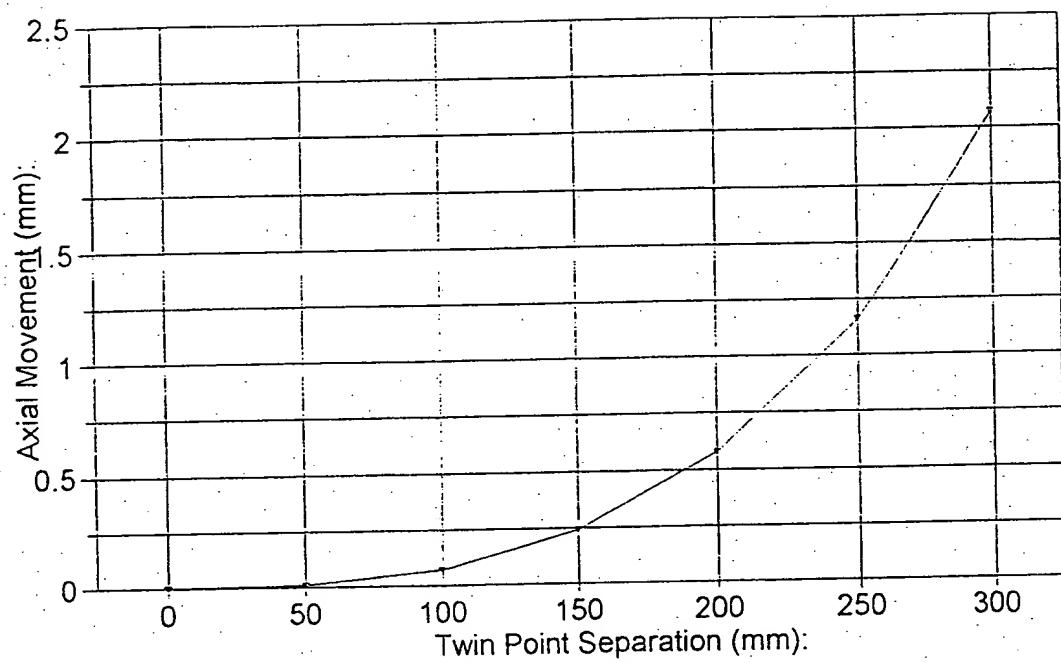
5 / 6



GRAPH D

FIGURE 5

6 / 6



GRAPH E

FIGURE 6

INTERNATIONAL SEARCH REPORT

International Application No

CT/IB 99/01574

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 B60S1/38 B60S1/40

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 B60S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 785 002 A (QUINLAN W ET AL) 15 January 1974 (1974-01-15)	1-5,7-9,
Y	abstract; figures 1-7 column 2, line 10 - line 53 column 3, line 3 - line 53 ---	11,12 6,10
Y	EP 0 594 451 A (ANGLO AMERICAN IND CORP LTD) 27 April 1994 (1994-04-27)	6
A	abstract; figures 1-3 page 2, line 1 - line 10 ---	1,2,9
Y	GB 2 308 542 A (VALEO SYSTEMES ESSUYAGE) 2 July 1997 (1997-07-02) abstract; claim 1; figures 1-3 page 1, line 6 -page 3, line 3 ---	10
		-/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

14 December 1999

21/12/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
 Fax: (+31-70) 340-3016

Authorized officer

Westland, P

INTERNATIONAL SEARCH REPORT

.tional Application No

. CT/IB 99/01574

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 816 194 A (ROBERT BOSCH GMBH) 7 January 1998 (1998-01-07) abstract; figures column 2, line 26 -column 3, line 29 ---	1,2,6,9, 11
A	US 3 192 551 A (APPEL) 6 July 1965 (1965-07-06) claims 5,7; figures 1-3,7,8 column 1, line 29 - line 41 column 2, line 23 - line 72 column 3, line 9 -column 4, line 25 -----	1,2,6-9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

CT/IB 99/01574

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 3785002	A	15-01-1974	NONE		
EP 0594451	A	27-04-1994	DE	69303250 D	25-07-1996
			DE	69303250 T	07-11-1996
			ES	2088236 T	01-08-1996
			JP	2812651 B	22-10-1998
			JP	6340249 A	13-12-1994
			US	5485650 A	23-01-1996
			ZA	9307792 A	16-05-1994
GB 2308542	A	02-07-1997	FR	2743042 A	04-07-1997
			DE	19651230 A	03-07-1997
EP 0816194	A	07-01-1998	DE	29611722 U	06-11-1997
US 3192551	A	06-07-1965	NONE		

15

PATENT COOPERATION TREATY

PCT

REC'D	25 OCT 2000
WIPO	PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference F14582 IN/vd	FOR FURTHER ACTION <small>See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)</small>	
International application No. PCT/IB99/01574	International filing date (day/month/year) 23/09/1999	Priority date (day/month/year) 09/10/1998
International Patent Classification (IPC) or national classification and IPC B60S1/38		
<p>Applicant TRICO PRODUCTS CORPORATION et al.</p>		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input checked="" type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application 		

Date of submission of the demand 27/04/2000	Date of completion of this report 23.10.2000
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Peters, U Telephone No. +49 89 2399 8879



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IB99/01574

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-6 as originally filed

Claims, No.:

1-11 as originally filed

Drawings, sheets:

1/6-6/6 as originally filed

2. The amendments have resulted in the cancellation of:

the description, pages:
 the claims, Nos.:
 the drawings, sheets:

3. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IB99/01574

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-11
	No: Claims
Inventive step (IS)	Yes: Claims 1-11
	No: Claims
Industrial applicability (IA)	Yes: Claims 1-11
	No: Claims

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

(D1) US-A-3 785 002 shows a windscreen wiper - as depicted in Fig.3 of D1 - comprising a blade body 15 which is formed of resiliently flexible material (see column 2, lines 29 - 34 of D1) and which is connected to a force applying member 13,32,24. The mounting strip 24 is connected to the backbone at two apart points with screws 25. As shown in Fig. 3 the mounted strip is bent and extends away for spring 21, so that only the area of the screws 25 are in contact with spring 21.

The subject-matter of claims 1 and 2 differs therefrom in that the spacing distance S between the points being between $S1 = 0.1 * L$ and $S2 = 0.35 * L$ where the length L is the total length of the backbone or - the same teaching expressed with other wording - according to claim 2 in that the ratio R of spacing distance S between the points and the total length L ($R=S/L$) being between $R1 = 0.1$ and $R2 = 0.35$.

Therefore, the subject-matter of claims 1 and 2 are novel.

Claims 3 and 4 suggest a preferred calculation of the distance S and ratio R. These formulae are also novel.

The prior art documents mentioned in the Search Report don't give any suggestions to apply the novel formulae according to claim 1 to 4 or similar dependencies, so that the subject-matter of claims 1 to 4 are considered as involving an inventive step.

The dependent claims 5 to 11 contain further improvements for the windscreen wiper according to claims 1 to 4.

However, the features of these claims are either shown in D1 or (D2) EP-A-0 594 451 which suggests a curved backbone as defined in claim 6, so that the dependent claims don't contain features which are per se inventive..

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IB99/01574

Re Item VII

Certain defects in the international application

The determination of the optimal distances of the force applying points which controls the force intensity distribution depends further on (see lines 20 to 32 of the description, 1) the material from which the beam is made and the Young's modulus thereof; 2) The curvature of the beam; 3) the curvature of the surface (windscreen) 4) variation in any one or both of the width of the beam and the thickness of the beam; 5) the magnitude of the force applied to the beam.

However, these 5 factors are omitted in the formulae according to claims 1 to 4, so that these claims are not clear, because it is evident for the man skilled in the art to apply the factors 0.1 and 0.35 would not cover all variations off factors 1 to 5

Since factors 1 to 5 are necessary for a precise calculation the calculated preferred spacing according to claims 3 and 4 could only be correct for special factors 1 to 5.

Therefore, claims 1 to 4 seems not to be clear and the application of these formulae seems to be speculative for all the variations of factors 1 to 5.

Claims 1 and 2 contain the same technical teaching, so that one of claims 1 and 2 should be deleted.

The independent claim should be formulated in the two-part form.

Documents D1 and D2 should be mentioned in the description as the nearest prior art.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference F14582IN	FOR FURTHER <small>see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.</small> ACTION	
International application No. PCT/ IB 99/ 01574	International filing date (day/month/year) 23/09/1999	(Earliest) Priority Date (day/month/year) 09/10/1998
Applicant TRICO PRODUCTS CORPORATION et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :

contained in the international application in written form.

filed together with the international application in computer readable form.

furnished subsequently to this Authority in written form.

furnished subsequently to this Authority in computer readable form.

the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. Certain claims were found unsearchable (See Box I).

3. Unity of invention is lacking (see Box II).

4. With regard to the title,

the text is approved as submitted by the applicant.

the text has been established by this Authority to read as follows:

5. With regard to the abstract,

the text is approved as submitted by the applicant.

the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

as suggested by the applicant.

because the applicant failed to suggest a figure.

because this figure better characterizes the invention.

1

None of the figures.

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The abstract is modified as follows:

line 1: after "wiper" insert "(10)";
line 1: after "backbone" insert "(12)";
line 2: after "member" insert "(14)";
line 3: after "points" insert "(20,22)".

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 B60S1/38 B60S1/40

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B60S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 785 002 A (QUINLAN W ET AL) 15 January 1974 (1974-01-15)	1-5, 7-9, 11, 12
Y	abstract; figures 1-7 column 2, line 10 - line 53 column 3, line 3 - line 53 ---	6, 10
Y	EP 0 594 451 A (ANGLO AMERICAN IND CORP LTD) 27 April 1994 (1994-04-27)	6
A	abstract; figures 1-3 page 2, line 1 - line 10 ---	1, 2, 9
Y	GB 2 308 542 A (VALEO SYSTEMES ESSUYAGE) 2 July 1997 (1997-07-02) abstract; claim 1; figures 1-3 page 1, line 6 -page 3, line 3 ---	10
		-/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

14 December 1999

21/12/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Westland, P

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 816 194 A (ROBERT BOSCH GMBH) 7 January 1998 (1998-01-07) abstract; figures column 2, line 26 -column 3, line 29 -----	1,2,6,9, 11
A	US 3 192 551 A (APPEL) 6 July 1965 (1965-07-06) claims 5,7; figures 1-3,7,8 column 1, line 29 - line 41 column 2, line 23 - line 72 column 3, line 9 -column 4, line 25 -----	1,2,6-9

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 3785002	A	15-01-1974	NONE		
EP 0594451	A	27-04-1994	DE 69303250 D		25-07-1996
			DE 69303250 T		07-11-1996
			ES 2088236 T		01-08-1996
			JP 2812651 B		22-10-1998
			JP 6340249 A		13-12-1994
			US 5485650 A		23-01-1996
			ZA 9307792 A		16-05-1994
GB 2308542	A	02-07-1997	FR 2743042 A		04-07-1997
			DE 19651230 A		03-07-1997
EP 0816194	A	07-01-1998	DE 29611722 U		06-11-1997
US 3192551	A	06-07-1965	NONE		